

AN ANALYSIS OF THE SOCIAL FACTORS AFFECTING THE  
MEDICAL TREATMENT OF TWENTY PATIENTS IN DIABETIC  
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## TABLE OF CONTENTS

	Page
ACKNOWLEDGMENT . . . . .	ii
Chapter	
I. INTRODUCTION . . . . .	1
The Purpose of the Study . . . . .	1
Limitation of its Scope . . . . .	2
Method of Study . . . . .	3
II. WHAT IT MEANS TO HAVE DIABETES . . . . .	4
Symptoms and Signs of Diabetes . . . . .	5
Early Ideas in Treatment . . . . .	5
Causes and Prevention . . . . .	6
Present Methods of Treatment . . . . .	7
Incidence of Diabetes . . . . .	7
Social Implications . . . . .	8
III. THE MEDICAL SOCIAL WORKER AND THE DIABETIC PATIENT . . .	11
Medical Social Work at Hubbard Hospital . . . . .	14
IV. SOCIAL AND ENVIRONMENTAL FACTORS IN THE LIVES OF TWENTY DIABETIC PATIENTS . . . . .	19
Age and Sex . . . . .	19
Marital Status . . . . .	20
Education of Patients . . . . .	20
Religion . . . . .	21
Employment Status . . . . .	22
Income and Home Ownership . . . . .	23
Residence . . . . .	24
V. MEDICAL FACTORS INVOLVED . . . . .	25
Patient's Recognition of Symptoms . . . . .	25
Discovery of Diabetes . . . . .	29
Insulin and Patient's Ability to Use It . . . . .	30
VI. SUMMARY AND CONCLUSIONS . . . . .	33
APPENDIX . . . . .	35
A. Class I Diet - Menu I . . . . .	36
B. Class II Diet - Menu II . . . . .	37
C. List of Foods According to their Approximate Com- position of Carbohydrate, Protein, and Fat (Vege- tables . . . . .	38
D. List of Foods According to their Approximate Com- position of Carbohydrate, Protein, and Fat (Fruits)	39
E. Benedict Test of Urine for Sugar . . . . .	40
F. Schedule . . . . .	41
BIBLIOGRAPHY . . . . .	45

## CHAPTER I

### INTRODUCTION

Mrs. M. had been told by her physician that she had diabetes; that she must refrain from eating any foods other than those given on her diet list, and that she must, for the remainder of her life, use insulin hypodermically. Her physician made the discovery that she had diabetes after Mrs. M. had been given a thorough physical examination. He gave her the necessary instructions, then turned to his next patient. What he did not know was that Mrs. M. was a widow with six small children who could not possibly, because of her economic status, have special foods; nor could she afford to buy a hypodermic needle and the insulin that he had prescribed for her.

This situation, discovered in the Diabetic Clinic at Hubbard Hospital, was just one of many similar ones that can be found in any hospital clinic. It seems almost futile to give medical advice when the prospect of carrying out instructions seems impossible.

After having been assigned to do Medical Social Work in the Diabetic Clinic at Hubbard Hospital (as a block-field-work student from the Atlanta University School of Social Work) the writer met many such situations as the one described. It was found that finances and other conditions made it practically impossible for many chronically ill patients to follow instructions as prescribed by physicians. It was on the basis of learning something of the ability of diabetic persons to carry out medical instructions that this study was made.

Purpose of the study.-- The number of persons suffering from Diabetes Mellitus increases yearly. "It is an hereditary disease characterized by impairment of the body's normal ability to utilize food. It has been estimated that approximately one out of every four persons is a 'diabetic carrier'. It can be controlled, but not cured, and is greater among Negroes than

was formerly suspected."<sup>1</sup> Diet is the keynote of treatment and it is this problem that constitutes the most troublesome phase of practical management. The education of a diabetic and his family is always essential to success in treatment.

Recent advances in the knowledge of diabetes have been remarkable and it is no longer regarded as a hopeless, progressive affair, but rather a disturbance of metabolism amenable to treatment. It is the purpose of this study to attempt to analyze the social environment of twenty cases to discover the effect environment has on the medical treatment of the diabetic patient, and the extent to which social factors have complicated these patient's illnesses.

This study has been presented in the hope that it will add to the skill of the Medical Social Worker in assisting diabetics to deal more successfully with the realities of their lives.

Limitation of its scope.--The study is confined to cases taken from the Metabolic Clinic of Hubbard Hospital, Meharry Medical College in Nashville, Tennessee. The twenty case studies to be analyzed represent, with one exception, every person who came to the hospital for treatment, either as a 'known diabetic' or who, after examination, was discovered to have diabetes during the writer's internship. The one exception was that of a patient who died before sufficient data had been collected. The time of the study, February through June, 1941, represents the period of the writer's contact with the patients. Because the cases do not lend themselves to strict statistical analysis, the method used is of case histories rather than a statistical study. As far as it is know, no other study from the

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<sup>1</sup>Diabetes Mellitus(Indianapolis, 1940), p. 12.

same source has been made nor published.

Method of study.-- A schedule was devised which was divided into two parts. The first part was designed to give social and medical factual information. The second part included both the attitude of the patient and of his relatives regarding the patient's illness. Schedules were filled out by the writer from medical social case histories and personal interviews with the patients. The interviews were held, for the most part, in the hospital clinic or wards; in a few instances they were held in the patient's homes. Source material on diabetes and medical social work was used for general background.

## CHAPTER II

### WHAT IT MEANS TO HAVE DIABETES

Since Diabetes Mellitus is a condition which responds readily to treatment but untreated, may result in economic dependency of the individual, permanent invalidism and eventually death, some description of the disease from a medical aspect is important.

Diabetes is an hereditary disease, characterized by impairment of the body's normal ability to metabolize or use food. "This metabolic defect is manifested by increased amounts of sugar in the blood and subsequently by the excretion of sugar into the urine."<sup>1</sup> The first real progress was made by Langerhans when he uncovered the root of evil in a group of minute glands lying in the neck of the pancreas. The pancreas is one of the most important organs in digestion and is shaped like an elongated comma; it is found in the fish hook formed at the small end of the stomach. The tiny glands in the pancreas are ductless and their secretion is absorbed directly by the blood.

Langerhans found that if they removed the pancreas of a dog, the animal exhibited all the symptoms of diabetes. "He could not, however, obtain more than an impure and useless extract from these glands, and those who followed him likewise failed."<sup>2</sup> It was not until 1922 that two young physicians, Drs. Barning and Best, while experimenting in the laboratories of

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<sup>1</sup>Ibid., p. 9.

<sup>2</sup>Robert D. Reynolds, "In the Shadow of the Needle", Hygeia(August, 1933), p. 2.

the University of Toronto, succeeded in isolating a fairly pure substance which was insulin. On test it lowered decidedly the blood sugar of a rabbit in which diabetes had been artificially induced.

Symptoms and signs of diabetes.--The date of onset is usually indefinite and its approach insidious. The most characteristic symptoms of the disease are the passage of large amounts of urine, increased thirst, and excessive appetite, accompanied by loss of weight and strength. Loss of strength develops because the patient is deprived of the food value of the sugar lost in the urine and because the utilization of fat is imperfect as well. Other commonly encountered complaints are skin disturbances, such as localized or generalized pruritus (itching), carbuncles, and slowly healing ulcers, disturbances of vision, numbness and tingling, and pain (neuritis) especially in the lower limbs.

In mild cases, or soon after the actual onset of the diabetic state, glycosuria (sugar in the urine) may exist without subjective symptoms and not infrequently it is the only sign. Often diabetes will not be found without active search.

Early ideas in treatment.--Diabetes is an ancient disease. It was first recognized as a distinct ailment by physicians in the Roman Empire "about the time of Christ, merely as far as diagnosis was possible from excessive thirst and urine."<sup>1</sup> Nothing of importance was added for the next 1600 years, when Thomas Willis furnished a better means of diagnosis; namely, the sweet taste of the urine. Advance was now more rapid, because a little more than a century later, in 1796, another English doctor, John Rollo, introduced a crude empiric diet treatment which restricted

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<sup>1</sup>Frederick M. Allen, "Scientific Progress in Diabetes," Hygeia (June, 1938), p. 10.



carbohydrates. The scientific period began between 1830 and 1840. The one century since then has developed all of the chemical methods of urine and blood analysis, nearly all of the knowledge of metabolism of foods, and of the glands of internal secretion.

Causes and prevention.--The immediate cause of diabetes is a deficiency of endogenous (produced within) insulin. Whether the blood-sugar-reducing principle elaborated by the pancreas of the diabetic is quantitatively or qualitatively deficient, or, whether it is normal as originally produced but subsequently neutralized by other agents, the end result is insulin deficiency and diabetes. Besides this immediate cause, however, there are certain predisposing factors.

A predisposition to diabetes seems to be inherited as a mendelian recessive character and "this influence is now considered to be of primary importance, although such predisposition may not be revealed until late in life or even until long after the development of the disease."<sup>1</sup> In view of these facts, it is inadvisable for members of diabetic families to intermarry, because of the greatly increased probability that such intermarriage may produce diabetic offspring.

"Most experienced clinicians agree that there is a relationship between obesity and the development of diabetes."<sup>2</sup> How obesity predisposes to diabetes has not been explained, but the fact remains. Apparently two causative forces operate to disturb the metabolic equilibrium of many people under such circumstances; more food material is taken in, and less muscular energy is expended in burning it up.

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<sup>1</sup>Reginald Fitz, "Diabetes," Hygeia (February, 1938), p. 7.

<sup>2</sup>Charles F. Bolduan, "Diabetes-An Important Public Health Problem," American Journal of Public Health

Because of the etiological significance of obesity, the prophylactic value of avoiding over-nutrition must be emphasized. By urging the relatives of the diabetic to keep their weights within normal limits, the development of diabetes in those most susceptible to it might be prevented. When diabetes or diabetic heredity exists, further transmission of the disease may be completely avoided only if the chosen partner in marriage is a non-diabetic member of a non-diabetic family.

Present methods of treatment.--Diabetic management is still the backbone of therapy in diabetes. The advent of insulin has made it possible for the diabetic to advance from the status of painful starvation to one of normal nutrition.

Any diabetic diet must first of all, foster in the patient a sense of well-being. Secondly, it must promote the attainment or maintenance of the 'ideal' normal weight of the patient. The 'ideal' diabetic diet should not force the patient to store fuel but should meet without excess, the immediate daily needs of the patient.

Incidence of diabetes.--Inasmuch as diabetes is not a reportable disease, there is no ready means of determining its prevalence. This difficulty is increased by the fact that many cases are unrecognized. Recent estimates by several investigators, of the number of diabetic persons, have been based upon the census and upon reports of the Metropolitan Life Insurance Company. It seems probable that there are over 500,000 cases of diabetes in the United States today.

Part of the increasing incidence of diabetes is merely apparent and is due to the general application of improved methods of diagnosis and treatment. There actually are more cases, however, a fact which is partially explained by increased longevity of the population as a whole.

"Diabetes is most frequently seen in women past middle life, although no age is exempt. The incidence of the disease is greater among Hebrews than among Gentiles. It is also greater among Negroes than was formerly suspected. It is said that diabetes among the Chinese and Japanese is not only infrequent but relatively mild.<sup>1</sup> The food of these people is largely carbohydrate and their apparent relative freedom from diabetes suggests the possibility that a large amount of carbohydrate in the diet is not the cause of the disease and perhaps may even indicate the type of diet which is most suitable in its management.

Social implications.--The person with a severe case of diabetes must diet carefully and must also take insulin. He must learn how to use a hypodermic syringe, and he must be familiar with the sensations that develop from insulin overdosage, for if too much insulin is injected, the person receiving it may suddenly feel weak and faint, symptoms that are quickly corrected by a little sugar.

A diabetic must live a regulated and rigid life, "obeying the rules of living that help insure his good health, never wavering from the path which the intelligent diabetic patient walks."<sup>2</sup>

Even when dietary adjustments are carried out, the feet of the diabetic are a source of concern. The trimming of a callous with a razor is to be condemned in a normal person; in a diabetic, risk of infection is multiplied many times. "The poor circulation of the diabetic's foot coupled with his proverbially low resistance to infection leads all too often to gangrene instead of merely to transient infection. A gangrenous

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<sup>1</sup>Ibid., p. 23.

<sup>2</sup>Ione Leonard, "A Diabetic's Disposition," Hygeia(April, 1939), p. 308.

toe or foot is a dead member and must be amputated."<sup>1</sup>

Scrupulous personal cleanliness is of the greatest importance. Diabetics must bathe their feet daily with warm water and soap, drying them carefully without harsh rubbing between the toes. Nails must be cut straight across and not curved, lest ingrown toe nails be invited. Fungus infections of the athlete's foot variety must be prescribed for by a physician and not a druggist. Shoes must be soft and roomy without being loose. Socks must be of a weight to furnish warmth and protection without causing excessive perspiration. New shoes should be worn around the house until well broken in so that no blisters will form. Diabetics must avoid constricting elastics about his legs and should learn not to cross his knees lest a feeble circulation be further impaired. Electric pads and hot water bottles must be used with the greatest caution, especially during sleep, as feet with such poor blood supply are easily burned.

There cannot be too much stress on the importance of each diabetic's learning to test his own urine. This is not difficult and children as well as adults learn to take pride in the normal blue tests. These are best carried out on the urine passed one or two hours after each meal, as it is most likely to contain sugar at this time. Occasionally it is of advantage to test the fasting specimen before breakfast.

Practically all diabetics ask if insulin can be taken any way other than with a hypodermic needle. Unfortunately, it cannot; it must be introduced under the skin so that insulin can be absorbed by the blood stream. "It is absolutely necessary then, for the person with diabetes to use his needle. He is not taking any form of drug. He is taking a

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<sup>1</sup>Allen Johnson, "Advice for Diabetics," Hygeia (July, 1940), p. 626.

substance most vital to him; it is his life. He asks the public to be a bit more understanding of him and of his needle in whose shadow he must live."<sup>1</sup>

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<sup>1</sup>Reynolds, op. cit., p. 4.

## CHAPTER III

### THE MEDICAL SOCIAL WORKER AND THE DIABETIC PATIENT

Buchanan stared at an ant which was struggling up the log, half-pushing, half-carrying a seed twice as big as itself. He was tempted to pick up the seed, and to do a job of portage. But one could not be sure just where the ant would like it put. He felt, vaguely, that there was a moral in that somewhere.<sup>1</sup>

There is no reference to social work, explicit or implicit, in the novel from which this quotation is taken. Yet Mr. McGuire has stated, in Buchanan's thought, one of the basic principles of case work practice. It would frequently seem easier, quicker, more effective, to make for other people the decisions about which they seem dilatory, to determine and to execute, their plans. But the case worker recognizes that the client himself must be in control of the guiding of his own life, and make for himself the choices that are necessary in fitting his individual desires into the social pattern. The worker attempts to help him see more clearly the world in which he lives, to use his own powers more effectively, and many times, to soften the impact of external reality, but the final choice of the pattern he wants his life to take in matters large and small, is his, and not the worker's to make.

While this is the basic principle underlying all case work, we must go a step further to get a view of medical social work. The primary purpose of medical social work, also known as medical social service, or hospital social work or service, is to further the medical care of the patient by a method of medical social case study and treatment, which is that of

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<sup>1</sup>Paul McGuire, A Funeral in Eden (New York, 1938), p. 88.

social work correlated with medical treatment. It requires the assembling and analyzing of data, and the outlining, and carrying through of an integrated medical social plan. Its basis is the medical need of the patient, a need which may be aggravated by social conditions and may therefore require social as well as medical treatment.

There are three aspects of medical care in which the medical social worker may be especially helpful, and in which close cooperation of the doctor and social worker is particularly valuable. These are: (1) social problems as a cause of illness; (2) social problems as a result of illness; and (3) social problems as related to convalescent care.

Of all the chronic diseases, Diabetes places the greatest burden of watchfulness upon the victims. No other disease demands such constant vigilance as the price of health. When diabetes is discovered, its severity must be determined and its management planned. Then the patient must be carefully instructed and finally the treatment of the disease must be placed largely in his own hands. The care of the diabetic requires "not only special medical knowledge and facilities for quantitative chemical measurements and for careful dietetic calculations, but also a knowledge of each diabetic patient as an individual."<sup>2</sup> No matter how carefully the food requirements and insulin dosage are worked out or how thorough the instruction, it is in the last analysis the personal characteristics of the patient that determines the success of treatment. The attitude of the patient toward the disease, the adverse social factors or emotional strain that may hinder or raise difficulties in its treatment, the temperament, the quality of will power and the ability to learn and to

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<sup>2</sup>G. Canby Robinson, The Patient as a Person (New York, 1939), p. 146.

remember are all matters to be evaluated in the care of the diabetic patient. We consider very important, diagnosis, evaluation of the severity of the disease, planning of its treatment, and instruction of the patient as to what to do to preserve his health. There are always a variety of personal problems encountered in the management of diabetes, as well as the social status of the patient and the personality of each.

Chronic diseases, such as diabetes, almost always cause some social problem in the family of the patient. Study and treatment of adverse social conditions are an essential part of the treatment and adjustment of patients in which the medical social worker cooperates closely. The home conditions and other factors, should be known regarding patients who are expected to have a convalescent period after leaving the hospital. The physical, mental and environmental problems should all be given consideration in planning convalescent care, as well as the social situation into which the patient is to go when well. So it is that problems of convalescence, too, must be studied and solved by the medical social worker.

These and similar problems require both medical and social treatment. In calling the attention of hospital social service to such situations, the medical problem and the recommendations should always be talked over with the social worker in order to assist her in working out a practical solution based on the medical treatment which the patient requires and the social resources available to meet them.

The medical social worker sees many patients more continuously than do others of the hospital personnel and gets to know them as individuals with peculiar needs. A great deal of effort is spent in helping patients to face physical limitations, whether these are actually presented in their own bodies or in some regime which limits normal activity.



Much has been said concerning the necessity for instructing diabetic patients in diet and insulin therapy. The actual teaching may be done by either the nurse, interne, or the dietician; it is an important part of the social worker's job to interpret and emphasize the importance of adhering to the prescribed diet. It is a great temptation (particularly as soon as the patient begins to feel better) to slip in a soft drink, a few pieces of candy and other forbidden foods. Fortunately, the dietetics of diabetes have so improved of late that patients are allowed to eat much more of a variety of foods than formerly, even having, on rare occasions, permission to eat a very small piece of pie, and other deserts, now and then.

It is usually necessary for a diabetic patient to readjust his entire mode of living; it is in this phase of adjustment that constant guidance is needed. While a diabetic suffers no great physical pain, he may, at the same time be a very sick individual. He may present some of the same reactions that any ill person might show. He may be cross and upset, emotionally unstable, and not know the causes back of it. There are many changes that are necessary for diabetics to undergo, and it is the responsibility of the medical social worker to prepare the patient for any, and all phases of reorganization.

Medical Social Work at Hubbard Hospital.--Meharry Medical College, located in Nashville, Tennessee, was organized in 1876 as a medical department of Central Tennessee College for the purpose of training Negro students in medicine, dentistry, pharmacy and nursing.. Its charter gave the college the power to maintain a hospital and the right to confer degrees.

Hubbard Hospital is the outgrowth of Meharry, and was added to the college in 1910, under the administration of Dr. George W. Hubbard as president of the school. It is a private non-profit hospital and cares

for Negro adults and children having acute medical and surgical diseases, maternity cases and such chronic diseases as can be relieved by temporary treatment. It offers opportunity for the study of disease, the teaching of medicine and the training of nurses. The total bed capacity is one hundred eighty-six (beds and bassinets) with a daily hospital census of one hundred and fifteen patients. The Out-Patient Department accomodates approximately one hundred-twenty-five to fifty patients daily. The Medical Social Workers are available to all services both in the Out-Patient and In-Patient Departments.

The Social Service Department of Hubbard Hospital was established in 1927, and now consists of a supervisor and one case worker. The department supplements medical treatment of clinical and ward patients through social adjustment where such a need is indicated. The workers follow up medical cases, interpret disabilities and furnish instructions in health care. Relief is obtained when needed. One of the most outstanding services is the administration of a fund sponsored and supported by a civic organization (Social Service Aid) that appropriates money to be used at the discretion of the department, to supplement the income of diabetic patients for the purchase of special diets. The average amount given each patient, depending upon the number of applicants, is generally one dollar per week per person. The department also purchases hypodermic syringes, and gets free insulin through the City Health Department, for indigent patients.

Knowing what community resources other agencies offer is an important part of the Social Service Department's job. In a community such as Nashville where there are limited resources, it was often difficult to make satisfactory plans for patients. This made it imperative for the social worker to study situations thoroughly that she might be able to

suggest a plan that was acceptable to the patient and also in line with the medical recommendations.

As there is no institution for the care of chronic patients other than the Davidson County Hospital, arrangements for after-care of patients had to be carefully planned.

The patient who came from a distance presented special problems. Arrangements for his after care often required correspondence with relatives and local agencies before satisfactory arrangements could be made. When certain types of treatment were recommended that required the patient to remain in Nashville after discharge from the hospital for the continuation of treatment, the social worker was called upon to advise with the patient and the family about expenses involved for board and for transportation to and from clinic. All arrangements had to be made before treatment was started as no local agency would assume responsibility for financial assistance. This was essential in cases where an interruption of treatment would be harmful to the patient.

The admission of a patient to another institution often presented difficulties. If legal action was required, the necessary procedure had to be explained to relatives.

The patient in the hospital frequently faced difficult adjustments as the result of his illness, and these assumed undue proportions because of his helpless condition. He may have been anticipating difficulties in carrying out recommendations; or worrying about his future plans, or just in an emotional state as a result of various causes. The knowledge that the service of a social worker was available and that she was collaborating with the doctor often had a stabilizing effect on him.

A patient entering the Hospital is seen by the admitting officer so that he may decide if the patient should be hospitalized, or if referred

to the hospital from clinic, that he may make out the proper data for admittance. A patient or some member of his family is sent to the cashier's window to make the financial arrangements.

Prescriptions given in clinic, X-rays, etc. recommended in clinic are paid for at the cashier's window. These are sometimes sent to Social Service for evaluation of the patient's financial status when he says that he has no means of paying for them. The social worker may take this up with the doctor who gave the prescription, especially if the amounts asked for are large. In cases in which a patient, not expecting an X-ray, did not bring enough money with him, the social worker tries to see if these services may be postponed until later, giving the patient time to prepare financially. In cases known fully, recommendations may be made to the cashier.

In dealing with patients who said they had no money and could not pay for drugs or medication, unless the family was known well by the social service department, it was felt that it was best to be slow about recommending free prescriptions. The better plan was to furnish the cashier with a short summary of the social findings and allow him to use his own judgment; unless, of course, the doctor explained that the need was imperative from a medical point of view. In this instance, it was better for the doctor to intercede with the cashier.

Certain clinics were assigned to certain workers. The worker sat at a strategic point in the clinic where she was easily available to both doctor and patients. She tried, as a matter of routine, to see every new patient in order to know something about the patient as a person, and to find out if there were any specific social problems which might have bearing upon his medical condition. She got such information as names of members of the family, addresses, ages, occupations, or grades in school,

wages, rents, etc. It was necessary to do a great deal of this routine as some of the physicians did not see the need for referring patients to Social Service. The social worker discussed with the doctor in clinic any problems which she may have found and which she thought may have had medical value. It was always necessary to familiarize herself with the medical situation.

In the cases of patients referred by another hospital or health agency, a full medical report was sent to the physician requesting information; social information, only was sent from the Social Service Department to the social worker of any other agency knowing the patients.

The social worker visited patients on wards that were assigned to her. They had the same type of medical problems that she dealt with clinically. Ward visits were made when they did not upset the routine, but the worker always tried to be on hand when the doctors were making their rounds so that they might refer cases to her.

## CHAPTER IV

### SOCIAL AND ENVIRONMENTAL FACTORS IN THE LIVES OF TWENTY DIABETICS

What are the important things in the environment of patients having diabetes that complicate their illness? What sort of people are these diabetics who must live such carefully regulated lives if they are to live at all? From what kind of homes do they come, and how possible is it for them to make use of the medical advice they have been given? These and many other questions were considered after the decision to study diabetic patients was made.

Age and sex.--"All students of diabetes are agreed that the disease is more prevalent among females than males", and, "forty-four years and over is the age group which has by far the greatest proportion of diabetics."<sup>1</sup> The twenty patients studied seem to bear out this statement as will be seen from the following table:

TABLE 1  
AGE OF PATIENTS BY SEX

Age	Total	Male	Female
Total	20	5	15
Under 20	3	2	1
20 to 29	0	0	0
30 to 39	2	0	2
40 to 49	6	2	4
50 to 59	6	0	6
60 to 69	2	1	1
Over 70	1	0	1

<sup>1</sup>Charles F. Bolduan, op. cit., p. 22.

This shows that there were three times as many females as there were male patients and also that 60% of them were between forty and sixty years of age.

Marital status.-- Because he must live somewhat differently from others especially in regard to his diet, the family of the diabetic plays an important role in his situation. Of the twenty patients, more than one-half of them were married and living with their husbands or wives; three were widowed; three separated; and three single. Of the seventeen who had been married, three had never had any children; five had had one child(each); two had had two children; three had had three children; one had had four children; one had had five children; one had had ten children; and one had had fourteen children. All except three of the patients were found to be living with some member of his or her family group, ranging from two to eight members. The three who lived alone were women who had previously been married. Two of them were widows, and the third was separated from her husband, and his whereabouts unknown.

Education of patients.--All of the twenty patients had had some schooling. Six had had education above the 8th grade, and one was a sophomore in college at the time of the study. Only four had had less than a 5th grade education, and no one less than a third grade education, as shown by the following table:

TABLE 2  
EDUCATION OF PATIENTS BY SEX

Grade completed	Total	Male	Female
Total	20	5	15
Third	1	0	1
Fourth	4	1	3
Fifth	5	2	3
Sixth	2	0	2
Seventh	2	0	2
Eighth	1	0	1
High School (2 years)	2	0	2
High School (4 years)	1	1	0
Normal School	1	0	1
College (sophomore)	1	1	0

The patient who was in college had a thorough knowledge of the implications of diabetes. He knew exactly how to regulate his dosage of insulin according to symptoms; he realized the importance of following a diet and adhered closely to the diet he was given.

As a whole, those patients who had had a small amount of education showed less ability to follow medical instruction than those having had more education with four exceptions. No one of these four patients had gone beyond the 5th grade in school and yet their ability to carry out instructions both as to diet and insulin exceeded that of most of the other patients. One old lady who did a good job of learning to administer her own insulin was 71 years old and had only completed the third grade, but she understood and followed all of her instructions carefully. Three patients, two women and one man, who had only had 4th and 5th grade education also were most successful in their ability to understand and follow instructions.

Of the patients who had completed the 8th grade and continued in school, only one showed a response contradictory to one which might be expected of a high school student. She had completed two years in high school but failed to follow instructions both in diet and the use of insulin. Because her clinic attendance was very irregular, it was difficult to arrive at any understanding of her failure, but the writer received the impression that this patient had never been able to recognize the fact that only through following instructions carefully, could her condition improve.

Religion.-- Conflicts between religious beliefs and medical treatment are not uncommon. On examination of the religious faiths of the 20 patients it was shown that, 11 were Baptists, six Methodists, two were Sanctified, and one was Catholic. The emotional conflict created by clashes between



medical advice and religious beliefs are shown in the case of Mrs. A. J.

#### Case No. 1

Mrs. A. J. was 53 years old and had come to the hospital complaining of fits and falling out spells. She had been diagnosed as having diabetes and treatment was recommended. She belonged to a sanctified church that disapproved of medication, believing in healing by faith only. The patient responded fairly well to treatment for a while, but would from time to time, have recurrences of the fainting spells. As long as she stayed on her diet, and kept regulated through insulin, she had few upsets, but as soon as she resumed her healing by faith, she would go off her diet and consequently become seriously ill. For the four months that the patient was seen she showed little or no improvement; her emotions fluctuated constantly, and at times she could see the necessity for combining diet and insulin therapy with her healing by faith, at other times she "wasn't sure". During one of her spells she was hospitalized, but immediately signed herself out of the hospital.

Employment status.-- At the time of the study, seven of the patients were unemployed because of their illness. Periods of unemployment ranged from five weeks to three years. Before their illnesses made it impossible for them to work, five of these patients had been employed as domestics or laborers and one each as a restaurant worker and in the ice business. Their wages had ranged from \$4 to \$15 per week. Five patients were housewives not gainfully employed, one was a student, and the seven others employed at the time of the study, had the following occupations: three in domestic and personal service; one factory worker; one at C. C. C. Camp; one farmer; and one beautician. The earnings of these patients regularly employed, varied from \$3.50 to \$35.00 per week, with four of them receiving \$10.00 per week or less. The factory worker earned \$15, and the amounts earned by the farmer and the beautician varied according to the time of the year, weather, and other factors. Considering the usual wages of those patients who were then unemployed because of illness, as well as those of the patients who were working, it will be noted that the majority of patients fell into the wage class receiving less than ten dollars a week.

Income and home ownership.--None of the patients kept any kind of a budget, but spent their salaries as far as they would go and "used whatever was left over for food." Because of this it was difficult to get any very clear picture of the financial situation. However, four of the patients either owned, or were in the process of buying, their own homes. Others paid rent varying from \$6.50 per month to \$11.50 per month. One paid no rent because he lived at his place of employment, and one paid as much as \$35 a month but sublet to another family. Some of the homes were squalid, inadequate quarters, in most instances without toilet facilities or running water indoors. Two of the homes were very much overcrowded; one of them, a two-room affair, had only one bedroom shared by six persons, and five persons lived in a three-room house with only one bedroom. The remainder of the known situations were fairly adequate. The families that lived in their own homes averaged one bedroom apiece for each individual.

Sources of income were difficult to determine but it was found that while the families of six patients had at times received periodic Public Assistance, only one, was receiving relief in the form of an Aid to the Blind grant, at the time of the study. One man, during his five weeks of unemployment, had had sufficient insurance, plus the ten dollars per week earned by his wife, to adequately provide for his needs during that time. One woman had been out of work for six months. Her son contributed something towards her support every week, and she was given one dollar for special foods from the Social Service Fund. Another man had been unable to continue his ice and soft drink business, but was receiving one dollar per day Veteran's Pension.

The remaining three of the seven patients unemployed at the time of

the study, were taken care of by their husbands or children with subsidies from the Hospital Social Service Fund for special dietary items.

Residence.-- Only four patients did not live in the city of Nashville, but came from rural towns nearby, within the state of Tennessee and had been referred to Hubbard Hospital by their local physicians. Of the other sixteen patients, six had been born in Nashville, and the remainder had lived there for varying periods of from one year to twenty-six years. This would mean that in the majority of cases, all patients had had adequate medical facilities available. It also means that if not able to care for themselves financially, they were eligible for Public Relief in Nashville by reason of their settlement.

On the whole, the social and environmental factors in the lives of these twenty patients appear not to present serious handicaps in following medical instructions.

## CHAPTER V

### MEDICAL FACTORS INVOLVED

Patient's recognition of symptoms.--According to the medical diagnoses of the twenty patients, there were eleven severe diabetics (having three or four plus sugar in urinalysis) and nine non-severe. In some cases the patients had been conscious of the usual symptoms of diabetes even though they did not realize their significance. In other cases the patient had not even been aware of symptoms of trouble; two had had only vague symptoms of not feeling well; five had had either recognized indicators or accompanying complications such as two still births had by one patient. Two other patients had always been very obese, and two had been having severe cases of neuritis. The following two cases are direct contrasts of the experiences diabetic persons may have in being conscious of their illness:

#### Case No. 2

Mrs. L. S., aged 47, was referred to Hubbard Hospital by her local physician in a neighboring town, for instructions in diet and the use of insulin. She had been employed in domestic service prior to her illness and had "never been sick a day in her life." Several months before coming to the hospital she had begun to drink excessive amounts of water both during the day and at night, with frequent urination. She developed a huge appetite, but noticed a loss of weight and strength. She consulted her physician who diagnosed her illness as diabetes. Upon questioning she admitted having had most of the usual symptoms of diabetes; neuritis, itching, and finally, visual disturbance. She consulted an eye specialist who said that her failing eyesight was due to her general condition. Following this, her physician sent her to the hospital for insulin therapy.

#### Case No. 3

Mrs. D. P., aged 53, had worked as a maid in the X Factory for eighteen years. Other than the usual childhood diseases, the patient had had no previous sicknesses. She was amazed when the company doctor sent her to Hubbard Hospital. All employees of this factory are given physical examinations every six months in order to be eligible for company insurance. During a routine urinalysis this patient's test was found positive for sugar. When asked about diabetic symptoms, she said

that she had had none. However, the patient was a "big eater", but had lost 40 pounds in a year. Except for these two things, she could not recall ever having had any of the other symptoms of diabetes. She "never dreamed" she had diabetes, as she had always been "a heavy eater."

One of the complicating things about diabetes is that many cases are unrecognized. Because "a predisposition to diabetes seems to be inherited"<sup>1</sup> an attempt was made to determine what part heredity had played as a possible cause of diabetes in the cases studied. There were only two (both deceased) known diabetic relatives; one patient gave as the cause of the death of her child, "sugar diabetes"; the other one said that her mother had died of diabetes. Four of the patients had "suspected" diabetics in their families; one was an aunt (deceased) "whom I'm pretty sure had diabetes"; one patient "guessed" her daughter had it, since she has come of the same symptoms that the mother had; a third said that she thought both her mother and father were diabetics but that they would not go to a doctor. Still another commented that her entire family is overweight so she "thinks they all have it."

Joslin emphasizes the role of obesity in the development of the disease in those with diabetic ancestry, and says that "diabetes is the penalty of obesity."<sup>2</sup> The cases studied were of patients under varying stages of regulation and treatment, so that, at the time of the study, the disease in some of the patients was well controlled and an adjustment may have been made in weight. The five male patients did not corroborate the usual characteristic of obesity. Only one of the five was fat, the others were thin. The female patients presented a different picture, showing a majority in the overweight class. Of the ten obese (140 pounds or over) patients,

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<sup>1</sup>Diabetes Mellitus (Indianapolis, 1940), p. 12.

<sup>2</sup>E. P. Joslin, Treatment of Diabetes Mellitus (New York, 1935), p. 256.

there were the following weights and ages respectively:

pounds	years
222	32
185	53
160	53
157	38
207	43
196	53
185	51
145	44
209	17
190	43

Continuing a listing of symptoms that might have been indicative of diabetes, notice was taken of the result of the pregnancies of the female patients. Mosenthal feels that pregnancy is often an existing factor in the development of diabetes.<sup>1</sup> Two patients, each, reported having had one still-birth; one patient had had two still-births; and one patient had had three miscarriages. These facts may, or may not, be significant in bearing out the suspicion of undiagnosed diabetes and its complications during pregnancy in these patients.

#### Case No. 4

Mrs. H. U. was 32 years old and five months pregnant when sent to Hubbard Hospital by a Public Health Nurse who had found sugar in her urine. Patient said that she had not heard of diabetes before, and that if she had it she had "just gotten it". In contrast to this statement, it was learned that, out of four pregnancies, Mrs. H. U. had delivered two still-born babies which suggested diabetes prior to its recent discovery. The patient lived in a rural area and while she "believed that nurses had examined her", in her other pregnancies, she did not know if urinalysis had been done. The patient was also very obese and weighed over 200 pounds. She was immediately put on a special diet and insulin therapy begun. There are as a rule, fetal heart tones heard through the eighth month; it is during the ninth month that "something happens" that results in still-births. For this reason, there was some discussion of the wisdom of terminating the pregnancy at the end of the eighth month rather than let it go full term. The patient was carefully watched, remaining in the hospital the entire time. Because she responded to therapy and showed no traces of sugar after three month's regulation, she was allowed to go full term. She delivered a girl child who further emphasized the suspicion of diabetes.

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<sup>1</sup>Mosenthal, "Diabetes in Pregnancy", Journal of American Medical Association, Vol. 55(August 17, 1935), p. 484.

Physicians claim that diabetic babies tend to be very large, and this baby weighed ten pounds at birth. She was apparently a healthy, normal baby, and at the time of the writer's departure, no indication that she was diabetic had been found.

"Diabetic coma was formerly the most serious complication of diabetes.

It is due to poisons from acids formed in the body when sugar no longer is being burned."<sup>1</sup> It was found that some patients did not know that they had diabetes until they had had a diabetic coma. The following cases are illustrative of such situations.

#### Case No. 5

Mrs. M. F., aged 44, was a beautician and lived very comfortably from an adequate income. In the earlier years of her marriage she had given birth, as the result of her only pregnancy, to a dead baby. In 1939 she had come to Hubbard Hospital in a coma and had "gotten along fine" after two weeks treatment. She was given a diet list but as soon as she felt better she "forgot all about the diet", ate as she pleased and did not continue the use of insulin. She said that the coma had been the first indication that she had had of being diabetic although she admitted having had the usual early symptoms. Subsequently, she had had a light attack and had consulted a private physician, who had given her a prescription. She had shown no improvement and following a second, more severe attack, she entered the hospital. She said, "I never want to have an attack like that first one I had. Those spells are the worst things I've ever seen. Its hard to describe how you feel. It comes on real sudden, starting around the waist, and you can feel it moving upwards, like blood rushing to your head. You get so sick, vomit, and feel so awful. It lasted about fifteen minutes and makes your head swim so that you fall out; there is no pain, but the most awful feeling". Patient said that she had been taught to administer her own insulin, and "I make a good doctor myself; I'd do anything if I thought it would keep me from having another one of those spells."

#### Case No. 6

Mr. L. V., age 44, was seen in the clinic. He had had an experience quite different from the one previously described. He had been away from work because of illness and complained of attacks of nausea and general feelings of sickness. He had been a known diabetic for eighteen years and had followed a diabetic regime "off and on" most of that time. He said that he knew what he should do, but he "would just get tired and slip up sometimes." When he first began to complain of not feeling well, he had consulted a private physician who told him that he had diabetes and sent him to Vanderbilt Hospital for regulation. He responded

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<sup>1</sup>Reginald Fitz, "Diabetes", Hygeia (February, 1938), p. 8.

to treatment and had no serious complaints for several years. A few days before the patient was seen in clinic at Hubbard, he had had an attack of coma; he said that he had **taken** sick suddenly and could not account for the attack. "I was home alone", he said, "and just felt myself getting sick all over, no pain, just a feeling of numbness, almost like being paralyzed. I was in a coma until six o'clock in the morning, and when my wife came home from work, I was half-frozen, out of my head and calling for help. I had tried to get up but could not, neither could I get back in bed and cover myself up." The patient had been instructed in diet and insulin therapy and as a rule, maintained a balanced metabolism.

Of the 20 cases analyzed, it was found that seventeen had had one or more attacks of diabetic coma; thirteen patients had had at least one attack, (ten severe, and three mild); two of them had had two severe attacks; one had had three severe; and one had had three or four mild attacks.

Discovery of diabetes.--Since the patients were so frequently unaware of their condition, an attempt was made to discover in what ways their illnesses first became recognized. Six had been known diabetics and under treatment with private physicians, or at other hospitals, prior to their coming to Hubbard Hospital. Four others were detected through routine examinations such as: urinalysis during pregnancy; required physical examination for Red Cross volunteers; regular check up at C. C. C. Camp; and for employment. The remaining ten were detected in the course of medical examinations as a result of various complaints such as, dizziness, boils, blindness, ulcers, heart trouble and other ailments. "A boil or carbuncle is a particularly dangerous infection in a diabetic, for it causes a mild diabetic to become severe, and is sometimes fatal to a severe diabetic. Before insulin was introduced, one out of every two diabetics with a carbuncle died."<sup>1</sup> In the following two cases, diabetes was detected because of the patient's concern over boils.

#### Case No. 7

Mrs. T. D., 52 years old, had complained of a boil on her foot for sometime before consulting a doctor. The physician told her that

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<sup>1</sup>Fundamental Concepts in the Treatment of Diabetes Mellitus (New York, 1940), Series No. 6.



she had a bunion, gave her a foot wash, and recommended a change in the style of shoes she had been wearing. She showed no improvement, so came to Hubbard Hospital. "They had to pack me, tote me, in. I could not walk so the doctor looked at my foot, and send me up to bed." After the patient had had an examination, she was told that she had diabetes. She said, "I've always worked and didn't know I had diabetes, but I've felt bad for the past three years, and kept having that boil on my foot. I used to bathe it in salt water, but it didn't get any better."

#### Case No. 8

Mr. G. O was 65 years old and had "never been sick a day in my life". He had been horseback riding one day, and bruised his leg, "and then a boil came on it. I used vaseline, lard and some salve, but it kept getting worse, so I went to the doctor who said I had diabetes. All the time the boil kept getting worse, so I came to the hospital because it would not heal."

Insulin and the patient's ability to use it.--While diet is important in the treatment of diabetes

....in about a third of the cases the diabetes is so severe that the patient cannot live comfortably by diet regulation alone. In such instances, insulin is indicated. Insulin is an extraordinarily helpful medicine. It must be taken hypodermically, however, and <sup>1</sup> cannot be taken by mouth or in any manner other than by injection.

Teaching a diabetic to administer his own insulin is an extremely important part of the education of these patients and an attempt is made in every instance to so instruct the patient. Because of some emotional feeling, and other factors, not all of the patients were able to be taught to give themselves insulin. One of the most unusual instances of successful instruction in insulin self-administration is shown by the following case:

#### Case No. 9

Mrs. H. B., 71 years old, had been a known diabetic for three years and under treatment most of that time. She is literate to a degree, can read and write "a little", but did not seem very intelligent. She has a difficult time making ends meet. Five of her fourteen children died in infancy and the remaining ones do not contribute very much towards the support of their father and mother. Since the parents have been too old to work regularly, they have had to get along the best they could. The patient depended entirely upon the money given her weekly from the Social Service Fund to purchase the special diet that she needed; at times, when there were more applicants than there was money,

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<sup>1</sup>Reginald Fitz, "Diabetes," Hygeia (February, 1938), p. 7

she was not subsidized and ate whatever the family happened to have. When the problem of administering insulin was first discussed, it did not seem likely that Mrs. H. B. would ever be able to give herself insulin. The Public Health Nurse taught her son to give the injections, but this did not prove satisfactory as he was at work during the day when she needed two of the injections. While the dietician and the clinicians felt that it was a hopeless situation, they very carefully explained and demonstrated the use of the hypodermic syringe. The patient's eyesight was very poor, the markings on the syringe were very small, so that mistakes in dosage seemed almost certain. The results were amazing; for more than two years she has been giving herself insulin, has never missed an injection, nor has she made a mistake in the dosage. When she came to the clinic she would bring along her syringe and show the markings "where I fill it up to". Even though the amounts to be taken have varied, Mrs. H. B. has never made a mistake. The staff at Hubbard has never ceased to marvel at the satisfactory results.

In some instances, it takes quite a while to coax a patient to give himself insulin. Frequently, once they have started, they discover that it is not such a terrible ordeal after all. For example;

#### Case No. 10

Mrs. P. T., 65, was a known diabetic for seven years and was under treatment most of that time. For the first few years she "just couldn't bear the thoughts of giving myself insulin". It was all she could do to allow her children to administer it. "Then", she said, "one day I decided I could do it myself and I've been doing it ever since. When I first started, I had a terrible time; my eyesight started failing me so I couldn't see so well. I've broken three needles off, one in my leg, but I just took hold and pulled it out. If I give myself insulin, I know I am getting the right amount."

At the time of the study, those patients who were hospitalized were in the process of being taught to administer their own insulin. The nurse or interne gave the injections to three of the patients who were confined to bed. After talking with these patients in an effort to evaluate their ability to give themselves insulin after discharge from the hospital, it was felt that two of the three would be quite capable; there was some question about the possibility of the success of teaching the third patient as she seemed to lack the necessary intelligence and understanding. Of the clinic Out-Patients, one is "just too nervous", so that her granddaughter has been

doing it for her; one patient probably could if she were not blind; three of these diabetics were being regulated through diet only; and one was not known. The remaining twelve were successfully administering their own insulin without apparent difficulty.

To illustrate the reactions of one of the patients, who possibly, can never be taught to self-administer insulin, there is the following case:

Case No. 11

Mrs. A. E. said she would "die if I have to give my own self insulin. I'm just too nervous." She was 54 years old and had been brought to the hospital in a diabetic coma. As she began to improve, the nurse tried every day for two weeks to get her to give her own injections, but without success. "I tried so hard, but I just cant do it. Looks like I'd get so nervous and shake all over so that I couldn't hold the needle. I'm so afraid I'll break it off. Maybe after I give myself the first one I wont mind, but I just cant get up enough nerve to stick myself."

For the most part the patients' understanding of their illness and ability to follow the necessary medical treatment was most encouraging.

## CHAPTER VI

### SUMMARY AND CONCLUSIONS

Having examined the social environment of twenty cases to discover the effect environment has on the medical treatment of these diabetic patients, and the extent to which social factors have complicated their illnesses, the following conclusions were drawn:

1. These patients, for the most part, were of fair means, education and ability.
2. From the facts gathered, there was little to indicate that their disease was causing any serious difficulty in the home or with the patients emotionally, except for one case.
3. Most of them have waited too long for treatment because they were unaware of the meaning of their symptoms. Some were not even aware of any symptoms.
4. There were three times as many female as there were male patients, and sixty percent of them were between forty and sixty years of age.
5. Of the 20 patients, eleven were married and living with their husbands or wives; three were widows; three separated; and three were single. Of the seventeen married persons, all of them, except three, had had one child or more.
6. In religion, eleven were Baptists; six Methodists; one was Catholic; and two were Sanctified. Religious faith created serious conflict in the treatment of one patient.
7. Only seven patients were unemployed at the time of the study

because of illness. Seven were employed and the majority of them earned wages of \$10 per week or less.

8. None of the patients kept a budget, however, four were home owners (or buying) and the remaining patients rented houses, paying from \$6.50 to \$35 per month.
9. All 20 patients lived in the State of Tennessee. Sixteen of these were living in the City of Nashville, and had lived there either from the time of birth, or from periods of from one to 26 years.
10. Only conjecture based on impressions received by the writer through interviews and observation, can be made as to the ability of these patients to respond to instruction and to carry out the medical advice. Bearing in mind that only a tentative evaluation can be made in most instances because of the short contacts, the writer feels that: nine patients may be considered competent to continue adequate therapy themselves; three showed little or no understanding of the implications of diabetes through indifference to clinic attendance, making little or no effort to attempt to follow their diets and negligence towards the use of insulin; eight seemed to have a fair amount of understanding but will need frequent checks on the instructions given and practised.

## APPENDIX

1

CLASS I DIET - MENU NUMBER I

Diet prescription-  
Total daily  
amount in grams  
of carbohydrate,  
protein, and fat

Carbohydrate 50 grams)  
Protein 50 grams) 1525  
Fat 125 grams) Calories

MEALS	Gm	HOUSEHOLD MEASURES	C	P	F
<b>Morning</b>					
Any fruit Group II	30	3 sections of an orange	3.0	0	0
Cereal (uncooked)	7	$\frac{1}{2}$ cup of cornflakes	6.0	0.5	0
Egg	60	1 medium-sized	0	6.0	6.0
Bacon, crisp	20	5 medium-sized strips	0	7.5	0
White bread	10	$\frac{1}{3}$ slice	5.3	1.0	0
Butter	20	1 small square	0	0.5	17.0
Cream (19%)	50	4 tablespoons	2.5	1.5	19.5
Coffee (no sugar)	--	As much as desired	0	0	0
Total for the meal	-	- - - - -	16.8	17.0	42.5
<b>Noon</b>					
Any vegetable Group I	100	$\frac{1}{2}$ cup squash	3.0	1.0	0
Any vegetable Group II	50	$\frac{1}{4}$ cup tomatoes	1.5	0.5	0
Any fruit Group II	30	2 T. orange juice	3.0	0	0
Meat, medium fat	60	1 medium slice	0	12.0	12.0
White bread	15	$\frac{1}{2}$ slice	8.0	1.5	0
Butter	25	1 square	0	0.5	21.0
Cream (41%)	20	$1\frac{1}{2}$ tablespoons	0.5	0.5	8.0
Coffee or tea (no sugar)	--	As much as desired	0	0	0
Total for the meal	-	- - - - -	16.0	16.0	41.0
<b>Evening</b>					
Any veg. Group I or III	100	$\frac{1}{2}$ cup cabbage	3.0	1.0	0
Any veg. Group I or III	100	$\frac{1}{2}$ cup stringbeans	3.0	1.0	0
Custard	60	$\frac{1}{3}$ cup	3.0	3.5	4.0
Eggs, boiled ( $1\frac{1}{2}$ )	90	$1\frac{1}{2}$ medium-sized	0	9.0	9.0
Mayonnaise	9	$\frac{2}{3}$ tablespoon	0	0	7.0
White bread	15	$\frac{1}{2}$ medium slice	8.0	1.5	0
Butter	15	1 square	0	0	13.0
Cream (41%)	20	$1\frac{1}{2}$ tablespoons	0.5	0.5	8.0
Coffee or tea (no sugar)	--	As much as desired	0	0	0
Total for the meal	-	- - - - -	17.5	16.5	41.0

<sup>1</sup>Diabetes Mellitus (Indianapolis, 1940), p. 64.

CLASS II DIET - MENU NUMBER II <sup>2</sup>

Diet prescription -  
Total daily  
amount in grams  
of carbohydrate,  
protein and fat

Carbohydrate 140 Grams )  
Protein 60 Grams ) 1430  
Fat 70 Grams ) Calories

MEALS	Gm	HOUSEHOLD MEASURES	C	P	F
<b>Morning</b>					
White bread	30	1 small slice	16.0	3.0	0
Any fruit (Group II)	140	14 sections of orange	14.0	0	0
Cereal (prepared)	20	4/5 cup cornflakes	16.0	2.0	0
Eggs	120	2 medium-sized eggs	0	12.0	12.0
Bacon, crisp	10	2 1/2 slices	0	3.8	5.0
Cream (19%)	25	2 tablespoons	1.2	0.7	4.7
Butter	5	1 square	0	0	4.2
Coffee (no sugar)	---	As much as desired	0	0	0
Total for the meal -			47.2	21.5	25.9
<b>Noon</b>					
White bread	30	1 slice	16.0	3.0	0
Any vegetable Group II	200	1 cup of stringbeans	6.0	2.0	0
Any fruit Group II	240	1 cup orange juice	24.0	0	0
Any other fruit	---	-- -- -- --	---	-	-
Potato baked	---	-- -- -- --	-	-	-
Meat, medium fat	60	1 slice	0	12.0	12.0
Cream (19%)	25	2 tablespoons	1.2	0.7	4.7
Butter	8	1 square	0	0	6.4
Gelatin	60	1/4 cup	0	2.0	0
Coffee or tea (no sugar)	--	As much as desired	0	0	0
Total for the meal -			47.2	19.7	23.1
<b>Evening</b>					
White bread	30	1 slice	16.0	3.0	0
Any veg. Group I	100	1/2 cup spinach	3.0	1.0	0
Any veg. Group II	100	1/2 cup beets	6.0	2.0	0
Any fruit Group II	140	1 1/2 cups pineapple	14.0	0	0
Rice cooked	---	-- -- -- --	---	-	-
Cottage cheese	60	3 1/2 tablespoonsful	2.4	12.0	0.6
Cream (19%)	50	4 tablespoons	2.5	1.5	9.5
Butter	15	1 square	0	0	12.0
Coffee or tea (no sugar)	11	-- 0-- -- ---	0	0	0
Total for the meal			43.9	19.5	22.1

<sup>2</sup>Diabetes Mellitus (Indianapolis, 1940), p. 74.



## LIST OF FOODS GROUPED ACCORDING TO THEIR APPROXIMATE PERCENTAGE

COMPOSITION OF CARBOHYDRATE, PROTEIN, AND FAT<sup>3</sup>

## VEGETABLES

## GROUP 1 - RAW VEGETABLES

## "5%" CARBOHYDRATE

			C	P	F
Cabbage, shredded	100	1½ cups	5	1	0
Celery	100	1 heart with 3 stalks	3	1	0
Cucumber	100	½ cup	2	1	0
Endive	100	-----	3	1	0
Lettuce	100	¼ to ½ head; 12 leaves	2	1	0
Radishes	100	10 medium-sized	4	1	0
Tomatoes, fresh	100	1 medium-sized	4	1	0
Tomatoe juice	100	Scant ½ cup	4	1	0
Watercress	100	2½ cups	4	1	0

## GROUP II - COOKED VEGETABLES

## "5%" Carbohydrate

Artichokes, leaves	100	-----	5	1	0
Asparagus	100	5 stalks, 8 tips, ½ cup	3	1	0
Beans, string, green	100	½ to ¾ cup	3	1	0
Beet greens	100	½ to ¾ cup	3	2	0
Broccoli	100	2/3 cup	4	3	0
Brussels sprouts, canned	100	About 10 sprouts	3	1	0
Cabbage	100	½ to ¾ cup	3	1	0
Cauliflower	100	½ to ¾ cup	2	1	0
Eggplant	100	½ cup, 4 average slices	4	1	0
Kale (Collard)	100	-----	4	1	0
Leeks	100	¾ cup	4	2	0
Mushrooms	100	½ cup; 4 medium	3	1	0
Okra	100	½ cup; 5 stalks	3	1	0
Rhubarb (no sugar)	100	½ to ¾ cup	3	1	0
Sauerkraut	100	½ cup to ¾ cup	3	1	0
Spinach	100	½ cup	2	1	0
Squash, summer	100	½ to ¾ cup	3	1	0
Swiss chard	100	½ cup	3	2	0
Tomatoes	100	½ cup	4	1	0

FRUITS<sup>4</sup>Group I  
(Approximately 5% carbohydrate)

	Grams	Household measure	C	P	F
Grapefruit A. P.*	100	1 grapefruit	5	1	0
Grapefruit juice	100	$\frac{1}{2}$ cup, scant	8	0	0
Lemons	100	$\frac{5}{6}$ of one lemon	5	1	0
Muskmellon A. P.*	100	$\frac{1}{4}$ melon	5	1	0
Strawberries	100	$\frac{2}{3}$ cup	6	1	0
Watermellon E. P.*	100	E. P.	6	0	0
Watermelon A. P.*	100	- - - -	3	0	0

Group II  
(Approximately 10% Carbohydrate)

Blackberries, uncooked	100	$\frac{1}{2}$ cup	8	1	1
Cranberries, uncooked	100	$\frac{1}{4}$ cup	10	0	1
Gooseberries	100	$\frac{1}{2}$ cup	9	1	0
Muskmelon E. P.*	100	$\frac{1}{2}$ cup	9	1	0
Orange	100	1 orange E. P.	10	0	0
Orange juice	100	$\frac{1}{2}$ cup	10	0	0
Peach	100	1 medium-sized	9	0	0
Pear	100	1 medium-sized	10	1	0
Pineapple	100	$\frac{2}{3}$ cup sliced- cubed	10	0	0

Group III  
(Approximately 15% Carbohydrate)

Apple	100	1 small	13	0	1
Apricots	100	$1\frac{1}{4}$ apricots	13	1	0
Blueberries	100	$\frac{2}{3}$ cup	15	1	1
Cherries	100	$\frac{1}{2}$ cup	17	1	1
Currants	100	1 cup	13	2	0
Grapes	100	20 large- 30 small	15	1	1
Grapejuice(no sugar)	100	$\frac{1}{2}$ cup scant	17	0	0
Huckleberries	100	$\frac{2}{3}$ cup	15	1	1
Rasberries	100	$\frac{1}{2}$ cup	15	1	0

<sup>4</sup>Ibid., p. 90.

\*A. P. - as purchased; E. P. - edible portion.

BENEDICT TEST OF URINE FOR SUGAR<sup>5</sup>

Drop exactly 4 drops (0.2 to 0.25 cc.) of the urine to be tested into a test tube, and add 2.5 cc of Benedict's qualitative solution. Stand the tube in water that is bubbling and boiling and allow it to remain exactly five minutes. Remove, shake, and disregard any discoloration on the surface. If the contents remain clear the urine is sugar-free. An opaque greenish precipitate indicates a trace of sugar; a yellow precipitate about 1 percent; and a red to reddish-brown sediment more than 1 percent.

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<sup>5</sup>Diabetes Mellitus (Indianapolis, 1940), p. 104.

SCHEDULE  
SOCIAL FACTORS CONNECTED WITH DIABETES

I. Identification Data:

1. Name \_\_\_\_\_ present age \_\_\_\_\_ sex \_\_\_\_\_
2. Address \_\_\_\_\_
3. Length of time in Nashville \_\_\_\_\_
4. Place of residence before coming to Nashville \_\_\_\_\_ urban \_\_\_\_\_  
rural \_\_\_\_\_  
\_\_\_\_\_ 2000-2500 population  
\_\_\_\_\_ 1500-1900  
\_\_\_\_\_ 1500-less

II. Current Social Data:

1. Marital Status:  
(Married ( ) Single ( ) Widowed ( ) Divorced ( ) Separated
2. Educational Status: 0 1 2 3 4 5 6 7 8 9 10 11 12  
\_\_\_\_\_ Grades completed
2. 1 2 3 4 \_\_\_\_\_  
College Degree Graduate Study
3. Occupation:  
Present \_\_\_\_\_  
Usual \_\_\_\_\_
4. Salary Range: (per week)  
\_\_\_\_\_ \$0-9 \_\_\_\_\_ \$30-39  
\_\_\_\_\_ 10-19 \_\_\_\_\_ 40-49  
\_\_\_\_\_ 20-29 \_\_\_\_\_ 50-over
5. Number of siblings: 0 1 2 3 4 5 6 7 8 over
6. Number of children patient has had: 0 1 2 3 4 5 6 7 8 over
7. Total family income: (per week)  
\_\_\_\_\_ \$0-9 \_\_\_\_\_ \$40-49  
\_\_\_\_\_ 10-19 \_\_\_\_\_ 50-59  
\_\_\_\_\_ 20-29 \_\_\_\_\_ 60-69  
\_\_\_\_\_ 30-39 \_\_\_\_\_ 70-over
8. Approximate expenditures: (weekly)  
\$ \_\_\_\_\_ rent \$ \_\_\_\_\_ clothing  
\_\_\_\_\_ fuel \_\_\_\_\_ medicine  
\_\_\_\_\_ light \_\_\_\_\_ food  
\_\_\_\_\_ insurance \_\_\_\_\_ for patient  
\_\_\_\_\_ other \_\_\_\_\_ for remainder  
\_\_\_\_\_ of family
9. Religion: \_\_\_\_\_  
Catholic  
Protestant (Specify) \_\_\_\_\_
10. With whom does patient live? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

III. Housing:

1. Number rooms in house 1 2 3 4 5 6 7 8
2. Number sleeping rooms 1 2 3 4 5 6 7 8 9 over
3. Number persons in household 1 2 3 4 5 6 7 8 9 over
4. Number of lodgers 0 1 2 3 4 5 6
5. Rent paid by lodger per week \$ \_\_\_\_\_

## IV. Medical History:

1. Age at onset of diabetes \_\_\_\_\_
2. First symptoms: \_\_\_\_\_  
 \_\_\_\_\_ loss of weight  
 \_\_\_\_\_ frequent urination  
 \_\_\_\_\_ increased thirst  
 \_\_\_\_\_ "dizzy spells"  
 \_\_\_\_\_ others
3. Length of time patient suffered from complaint before seeking any kind of medical care \_\_\_\_\_
4. First sought medical care through \_\_\_\_\_  
 \_\_\_\_\_ private physician  
 \_\_\_\_\_ hospital clinic  
 \_\_\_\_\_ hospital emergency  
 \_\_\_\_\_ other
5. Home remedies used? \_\_\_\_\_ yes \_\_\_\_\_ no \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
6. Diseases other than diabetes: \_\_\_\_\_  

_____ heart disease	_____ usual childhood
_____ rheumatism	_____ illls
_____ lues	_____ tuberculosis
_____ pneumonia	_____ gonorrhea
_____ arthritis	_____ influenza
	_____ others
7. Diabetic Relatives: (specify) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
8. Total length of time under treatment \_\_\_\_\_  
 \_\_\_\_\_ % of this time in hospital  
 \_\_\_\_\_ other
9. Medical treatment advised for patient \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
10. Medical treatment followed by patient \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
11. Patient's ability to follow physician's instructions as evaluated by medical social worker: (based on social investigation) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## 12. Inability to follow treatment due to:

_____ Lack of will power	_____ disbelief in diagnosis
_____ lack of intelligence	_____ lack of confidence in physician
_____ lack of cooperation	_____ medication too expensive
_____ indifference to condition	_____ other

## 13. Kinds and amounts of foods eaten before diagnosis: \_\_\_\_\_

## 14. Kinds and amounts of food eaten after regulation: \_\_\_\_\_

## 15. Greatest difficulties in following diet: \_\_\_\_\_

## V. Attitudes toward illness:

## A. Patient's:

1. Patient considers important cause of illness as \_\_\_\_\_

2. Does patient feel that his work is in any way responsible for his illness? Yes \_\_\_\_\_ No \_\_\_\_\_ How? \_\_\_\_\_

3. Any evidence of belief in healing by faith? \_\_\_\_\_ No. \_\_\_\_\_ Yes \_\_\_\_\_  
What? \_\_\_\_\_

4. Feeling about need for medication for remainder of life? \_\_\_\_\_

5. Realization of importance of continued use of insulin: \_\_\_\_\_

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